

‘翠冠’梨花芽休眠期碳水化合物变化及其相关基因表达研究

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Studies on Changes in Carbohydrate Contents and Related Gene Expression in Floral Buds of ‘Cuiguan’ Pear During Dormancy

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摘要以‘翠冠’梨 (*Pyrus pyrifolia* Nakai) 花芽为试材, 连续两年研究了其在休眠过程中的碳水化合物含量变化及编码 α -淀粉酶、 β -淀粉酶和 α -葡聚糖磷酸化酶等碳水化合物代谢相关基因的表达模式。两年的结果显示, 随着‘翠冠’梨花芽休眠的加深, 可溶性糖含量逐渐下降, 11月15日降到最低。此后, 在内休眠及其解除过程中可溶性糖含量呈上升趋势。花芽中淀粉含量随着休眠的加深逐渐下降, 最低含量出现的时间在年度间有所不同。随着休眠开始解除, 淀粉含量逐渐增加, 在完全解除前达到最大值, 其后则逐渐下降。‘翠冠’梨花芽的*PpAMY*、*PpBAM1*、*PpBAM2*和*PpPHS*在内休眠阶段均出现一个表达高峰, 然后逐渐下降直到内休眠完全解除前。之后, 除*PpBAM2*外, 其余3个基因再次上调表达。‘翠冠’梨花芽休眠期间, 淀粉含量的变化与*PpAMY*、*PpBAM1*、*PpBAM2*和*PpPHS*的表达变化之间存在联系, 由此推测这些基因可能参与了‘翠冠’梨花芽休眠期碳水化合物代谢的调控。

关键词: 梨 休眠 碳水化合物 基因表达

Abstract: Changes in carbohydrate contents and expression patterns of genes coding for alpha-amylase, beta-amylase and alpha-glucan phosphorylase in floral buds of ‘Cuiguan’ pear (*Pyrus pyrifolia* Nakai) were studied during dormancy period for two successive years. The results indicated that the content of soluble sugar in floral buds decreased gradually with increased depth of dormancy, and reached the lowest value on November 15. Then the soluble sugar content increased during endo-dormancy and dormancy release. The starch content in floral buds decreased with increased depth of dormancy. But there is a difference in the occurring date of the lowest content of starch between two years. The starch content increased gradually with the beginning of dormancy release, and reached maximum value just before total release of dormancy and then decreased gradually. *PpAMY*, *PpBAM1*, *PpBAM2* and *PpPHS* showed an expression peak at the final stage of endo-dormancy and then dropped gradually until the total release of dormancy. Thereafter, except for *PpBAM2*, other three genes up-expressed again. The change in the starch content correlated with the expression levels of *PpAMY*, *PpBAM1*, *PpBAM2* and *PpPHS* during the floral buds dormancy of ‘Cuiguan’ pear, which implied that these genes possibly co-regulated carbohydrate metabolism in floral buds of ‘Cuiguan’ pear

Keywords: pear, dormancy, carbohydrate, gene expression

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